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DEPARTMENTAL CIRCULAR

VOL. I

AUGUST 10, 1915

No. 4

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THE DEPARTMENTAL CIRCULAR is issued as a convenient means of intercommunication of official information among the personnel of the Department of Agriculture. Its circulation, therefore, will be limited to those having official connection with the department. Its editorial policy will be determined wholly by the specific class of

readers for whom it is published and, therefore, may depart somewhat from the editorial policy governing material issued for the public. While the material to be published will by no means be confidential, the department can not extend the circulation of this publication beyond its own employees and official collaborators.

AIM OF THE COTTON ACT.

The following is a brief summary of an address delivered by Francis G. Caffey, Solicitor of the department, before the Alabama State Bar Association, on July 10, 1915, at Montgomery, Ala.

For over 30 years there has been a gradual but steady extension in the types of Federal legislation affecting the conduct of business, predicated generally on the commerce and in some instances on the tax clause of the Constitution. There has been a turning from the State legislatures to Congress, and a widespread public demand for laws operating throughout the country irrespective of State lines.

The effect of this legislation on products dealt with has been almost universal in practice. This has resulted in part from the requirements of the Federal laws themselves and in part from the operation of State laws framed in conformity with Federal laws or from voluntary action by citizens.

Congress is far from having exhausted its powers in dealing with business. The recent application of Federal laws to new subjects does not involve novel legal principles and has been based on well-established, old court precedents. The cotton-futures act of August 18, 1914, is a fair example of this tendency of legislation.

Many States have laws relating to the purchase and sale of cotton for future

delivery. These have failed to accomplish their intention. Cotton is essentially an article of interstate and foreign commerce and is ordinarily sold either in States distant from those in which it originates or in foreign countries. The prices paid producers are dominated by the quotations of future exchanges.

A widespread feeling that abuses existed in the methods of the exchanges led Congress to attempt to afford relief.

Since 1884 Congress has considered at least 120 bills. Each house, prior to the Sixty-third Congress, went squarely on record separately as favoring a measure designed to destroy future exchanges. The House Committee on Agriculture of the Sixty-third Congress found that exchanges are capable of performing great service for the country, but that there were evils, the measure of which lay in the degree to which their quotations failed to express the normal operation of the laws of trade, which arose from or consisted of five conditions: (1) Multiplicity of standards of classification of cotton; (2) a system of fixed differences between values of grades; (3) the delivery upon contracts of certain low-grade and inferior cotton; (4) the failure of tenders of cotton on contracts to show the grades to be delivered; (5) the so-called pro forma delivery practice.

The cotton-futures act represents the attempt of Congress, and is designed to go no further than is necessary, to remedy the five faults. Its passage was

urged by producers, merchants, and spinners. It was also substantially indorsed by representatives of the future exchanges.

The gist of the act is this: It imposes generally on contracts of sale for future delivery made on exchanges a tax of 2 cents for each pound of cotton involved. It then prescribes two forms of contracts known as section 5, or "basis," and section 10, or "specific," contracts which are exempt from the tax and the penalties of the act. Lastly, it provides machinery for carrying the scheme into effect.

Contracts not made in compliance with the exemption sections are unenforceable in Federal courts, unless the tax has been paid. Failure to perform the contracts is not taxed or penalized.

Section 5 contracts cover the usual and ordinary transactions on exchanges and raise all the legal questions raised by section 10 contracts.

The act provides for the establishment of official standards of cotton classification by the Secretary of Agriculture. It then meets the abuses arising out of trading in basis contracts by requiring that, in order to escape the tax, dealings in section 5 contracts shall be limited to the official grades; cotton other than the basis grade shall be settled for according to the actual commercial differences in value on the sixth business day prior to the date of delivery, ascertained in a way prescribed by the statute; certain

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IMPORTANT RULINGS.

COMPTROLLER'S DECISIONS.

(Contribution from the Office of the Secretary.)

In recent correspondence with the Secretary of Agriculture the following principles have been enunciated by the Comptroller of the Treasury:

In construing an appropriation the meaning of a term as determined by the courts does not necessarily govern where it is the clear intent of Congress to give the words a broader meaning, and congressional debates over amendments may be looked to for confirmation of a conclusion reasonably to be drawn as to the object of the amendments. In the appropriation for the destruction of wolves, etc., (General Expenses, Bureau of Biological Survey, 1916), the term "public domain," as used therein, includes all reservations, of whatever character, over which the United States exercises jurisdiction or control to the exclusion of the several States. (Dec. dated June 21, 1915.)

The cost of the erection, on rented premises, of a temporary shed for the protection of apparatus and the installation of appliances necessary for the carrying out of experiments authorized by an appropriation may be paid therefrom, where the apparatus, appliances, and structure may be easily removed and the lease provides for such removal by the Government at the termination of the lease. (Dec. dated June 22, 1915.)

Except as a consideration of rental, if at all, the cost of a permanent improvement to be attached or affixed to a private building is not a proper charge against the Government; an improvement outside of the building and in the public street is not an improvement to the building itself, and property rights in such an improvement would necessarily remain in the Government after the period of occupancy of the building. (Dec. dated June 25, 1915.)

MEMORANDUM NO. 142.

Transfers from the Field Service to Washington.

The attention of the chiefs of bureaus and offices is directed to the rules of the Civil Service Commission regarding transfers in the department from the non-

apportioned to the apportioned service. When an appointee has been serving in the field and it is desired to assign him permanently to Washington, D. C., the approval of the Civil Service Commission must be secured *before* the transfer can be effected.

In this connection the rules provide that a person transferred from a nonapportioned to an apportioned position shall be required, previous to his transfer, to prove legal residence in the same manner as for original appointment. Persons who proved legal residence before appointment in the nonapportioned service, who have been continuously in the Government service since their appointment, and still claim legal residence in the State from which they were appointed, however, will not, in the event of their transfer to the apportioned service, be required to file another certificate to prove legal residence, but will be charged to the State from which originally appointed.

Recommendations for transfer of employees from the field service to Washington, D. C., must be submitted to the Office of the Secretary in ample time to secure the prior approval of the Civil Service Commission and must be accompanied in each case by a statement setting forth fully the reasons for the transfer. (See paragraph 17 of the Administrative Regulations.)

D. F. HOUSTON,
Secretary.

JULY 21, 1915.

MEMORANDUM NO. 144.

Regarding Participation by Department Employees in the Grading of Hay.

In view of the great diversity of market grades for hay in the different markets throughout the country, it appears desirable to avoid at this time any participation by department employees in the grading of lots of hay that might result in legal controversy. Questions, however, relating to quality of samples of hay which appear to be subjects of dispute should be referred to the Bureau of Plant Industry which, through its duly appointed committee, will describe the samples in detail, and assign the comparative ratings to samples of the same kind of hay.

D. F. HOUSTON,
Secretary.

JULY 28, 1915.

INSECTICIDE ACT.

(Contribution from the Insecticide and Fungicide Board.)

The Insecticide and Fungicide Board, composed of representatives of the Bureaus of Chemistry, Entomology, Animal Industry, and Plant Industry, is charged with the enforcement of the insecticide act of 1910. This act covers all kinds of commercial insecticidal and fungicidal preparations, including disinfectants which enter interstate commerce or are otherwise subject to the provisions of the act. Since it became effective, January 1, 1911, 3,564 samples have been collected for analysis and test.

The administrative work necessary in the enforcement of the act is performed by the board, acting as a board, with the assistance of various clerks and administrative employees.

CHEMICAL EXAMINATION.

The chemical, microscopic, and bacteriological examination of insecticides and fungicides (including disinfectants other than those used on horses, cattle, sheep, swine, or goats, is performed by the Bureau of Chemistry.

The Bureau of Chemistry determines the composition of the various insecticides and fungicides which come under its jurisdictions, ascertains whether the statements made on the label relative to composition are true, tests the efficacy of disinfectants and germicides, makes practical tests of same, passes on medicinal claims that may appear on labels, and passes on other claims which do not involve efficacy against insects or fungi infesting vegetation or domestic animals.

EFFICACY OF INSECTICIDES.

The testing of the efficacy of insecticides and of the various materials entering into the composition of insecticides, as well as the action of insecticides on foliage, is conducted by the Bureau of Entomology. For this purpose the bureau has established a field station at Vienna, Va., 12 miles west of Washington. The classes of insecticides tested include those recommended for use against insects infesting vegetation, households, warehouses, and certain insects infesting dogs and poultry. This necessitates an immense amount of testing, a large portion of which is done on a practical scale. During the winter months the greenhouse is kept stocked with many greenhouse and garden insects for testing purposes. As many different insects as possible are reared at the sta-

tion, while many others are collected in cities and other places. Often insecticides are tested against as many as 20 species of insects, to determine whether the claims made on the label are in accordance with facts. Aside from testing the insecticides, the various ingredients entering into their composition are tested in order to determine whether they are active or inert.

TESTING OF FUNGICIDES.

The testing of the efficacy of fungicides (other than disinfectants) and of the various materials entering into the composition of such fungicides, as well as the injurious action of fungicides and certain insecticides on foliage, is performed by the Bureau of Plant Industry. Numerous tests of such fungicides are carried on by this bureau to determine whether or not the claims on the label are true and also tests are made of the constituents of various commercial fungicides to determine whether such constituents are active or inert. It also passes on all fungicidal claims on labels. Such work is performed on the Arlington Farm, near Washington, D. C.; in rented orchards in New Jersey; at certain of the field stations of the Bureau of Plant Industry in different parts of the United States; and in the laboratory at Washington.

EXPERIMENTS WITH ANIMALS.

The chemical and bacteriological examinations of insecticides and fungicides used primarily on horses, cattle, sheep, swine, or goats, and efficacy tests of same are performed by the Bureau of Animal Industry. This bureau determines the composition of the various insecticides and fungicides which come under its jurisdiction, ascertains whether the statements relative to composition made on the label are true, passes on the efficacy of such insecticides and fungicides, passes on veterinary claims made on the labels, makes analyses and tests of certain disinfectants and germicides, etc.

Scientists in all four of the bureaus involved, paid from funds for the enforcement of the act, carry on such scientific investigations along their special lines as are necessary to obtain basic facts to aid in the enforcement of the law. No tests or analyses are made by the board for individuals or companies, but only such samples are examined as are collected by authorized collectors of the board for the purposes of the administration of the insecticide act, since miscellaneous samples submitted by individuals can not be used as the basis of action under the provisions of the act.

PREPARING ILLUSTRATIONS.

(Contribution from Division of Publications.)

In certain publications, illustrations and diagrams are of almost as much value as the text itself in making the meaning clear. There are, however, certain considerations of a somewhat technical nature which must be remembered in selecting photographs or in drawing up charts and diagrams. For this reason photographers and draftsmen of the Section of Illustrations in the Division of Publications will be glad to assist authors in selecting and preparing illustrations for contemplated bulletins and other publications.

In the past many drawings accompanying manuscripts have reached the Division of Publications which it was not practicable to reproduce for publication. Some of these are made on such a scale that when reduced to the size of the official bulletin page the lines run together, the letters are small and illegible, and the whole drawing is worthless as a means of conveying information. In such cases the work must be done all over again at the cost of considerable time and money. Another common fault is the inclusion in photographs of advertising signs, inappropriate backgrounds, and other objectionable features. Occasionally these can be removed by the skillful use of the air brush, but this is delicate work and requires an expert hand.

Whenever possible, therefore, it is suggested that the object to be photographed be brought to the Section of Illustrations and that one of the section's photographers take charge of the technical details of light, focusing, lens, time of exposure, etc. This is particularly desirable in the case of colored objects in which it is difficult to bring out the proper values. Where the actual work of photographing can not be done by the department itself a photographer may be sent into the field with such equipment as the circumstances of the case demand. Negatives taken in this way may be developed, retouched when necessary, and reprinted in the Section of Illustrations.

Pictures intended for reproduction are sent to the Government Printing Office and from there to the engraver. After the bulletin has been published the cuts and original photographs or drawings are returned to the Section of Illustrations and filed away for future use. Requests for duplicate electrotypes of these cuts are continually being received from pub-

lishers of various periodicals, and such electrotypes may be had at the usual commercial rates for such work.

Those unaccustomed to handling photographs or drawings frequently damage them inadvertently. No drawings or photographs should ever be folded, and they are also liable to injury through the use of metallic clips. Tracings placed in drawers infested with roaches are likely to be damaged by the insects eating the starch contained in the cloth. Again, when rubber stamps are used on drawings care should be taken not to pile or roll them until after the ink has become thoroughly dry. Ink and indelible pencils should not be used to indicate corrections on drawings. Photographs intended for reproduction should never be mounted, but should be attached to the paper by slitting the paper and inserting the corners of the photograph. When it is desired to indicate the layout of illustrations on a page some other means should be taken than pasting the photographs themselves, and the mounting should only be done in the Section of Illustrations, where necessary facilities are at hand. The lettering of photographs should also be left to the section's draftsmen.

In addition to preparing illustrations for publications, the Section of Illustrations does such work as making bromide enlargements, transparencies, charts and maps for expositions, lantern slides and charts for lectures, bromides for cotton standardization work, and blue printing. It also prepares working drawings, wall maps and charts, and patent drawings.

SANITATION BULLETINS.

In the article "The Field Man a Sanitarian" published in the July issue of the Departmental Circular reference was inadvertently omitted to Bulletin No. 57 of the department, "Water Supply, Plumbing, and Sewage Disposal for Country Homes," and to Yearbook Separate 634, "Clean Water and How to Get It on the Farm." These should have been mentioned as readily available and useful sources of information on the important subject of farm and household sanitation.

"An announcement," containing a list of over 800 congresses, conferences, and conventions to be held in California, February 20 to December 4, 1915, is on file in the library.

GRAIN STANDARDIZATION.

(Contribution from Bureau of Plant Industry.)

The Office of Grain Standardization is carrying on investigations relating to the handling, grading, and transportation of grain and the securing of data upon which to base definite grades.

These investigations are being conducted at Washington and field laboratories located at Baltimore, Md.; Chicago, Ill.; Decatur, Ill.; Kansas City, Mo.; New Orleans, La.; Fargo, N. Dak.; and at Portland, Oreg.

When these investigations were begun it soon became apparent that there was urgent need of a method for making rapid moisture determinations of grain, so that the rules for the commercial grain grades could be made definite in the specification of moisture content. To meet this need an apparatus for testing the amount of moisture in grain quickly and accurately was developed and recommended to the grain trade. The method and apparatus are described in Bureau of Plant Industry Circular 72. This apparatus has been generally adopted by the various grain inspection departments and the commercial grain trade, and the actual moisture content is now a definite factor in determining the commercial grade and in fixing values of corn.

Soon after definite percentages of moisture became a factor in grain grading immense quantities of grain were put through a drying process in order to raise it to a higher grade and to prevent deterioration. When the moisture test before and after drying was applied it was noticed that there was always an apparent shrinkage in the grain over what the moisture tests showed there should be. The question was referred to the Office of Grain Standardization, and investigation showed that the shrinkage and the reduction in the percentage of moisture resulting from the drying of grain do not, in fact, correspond.

The difference between the reduction in the percentage of moisture and the shrinkage in weight exists because there is a constant change of base in making the moisture test. The actual differences under different conditions of drying and shrinkage were worked out in table form and published in Bureau of Plant Industry Circular 32. These tables are now generally used wherever grain is dried in a commercial dryer.

Enormous quantities of grain, and especially corn, are lost or spoiled every year because it is shipped and stored in too damp a condition, and as an excessive moisture content is the primary cause of grain going out of condition while in

transit or storage, experiments were conducted to determine the maximum moisture that grain may contain and not spoil at various seasons of the year and in different places in the country. The results, which clearly indicate what may be expected when grain of any given moisture content is shipped or put in storage under different conditions, have been published in Bureau of Plant Industry Circulars 43 and 51, and Department Bulletin No. 48. Next to the moisture content of corn its soundness at time of shipping or storing is the most important index to show how long it may be expected to keep without spoiling.

DETERMINING ACIDITY IN CORN.

The amount of acid that is present in corn has been found to be a direct indication of the quality of the corn. The larger the amount of acid the more deterioration has taken place and the poorer the grade of corn. Corn deteriorates or goes out of condition in direct proportion to the amount of moisture present and the temperature to which it is subjected. Thus, by knowing the acid content, moisture content, and temperature, one can calculate very nearly how long a lot of corn can be expected to stay in condition or how safe it is to ship that corn at the prevailing temperature for that season.

The method of determining the acidity in corn has been used in connection with determining quality of corn in the investigations leading to the fixing of Government grades. Until recently the method required 16 and 20 hours to make a determination. Modification of the method has been nearly completed whereby the determination can be completed within an hour; and as the determination is a comparatively simple one, it can be used not only in connection with grain grading but also by the grain man in determining the risk of storing or shipping any given lot of grain.

The method of determining the acidity in corn is described in detail in Department Bulletin No. 102.

FEDERAL CORN GRADES.

The handling of grain at a maximum profit involves a careful study of the various commercial grades and one of the main projects of the Office of Grain Standardization is the assembling of data, through experiments and other investigations, upon which to base Government grades for commercial grain. With definite and uniform standards for the grading of grain throughout the United States, the producer and country shippers will be able to know with a

reasonable degree of accuracy the grades of their grain regardless of the market to which it is shipped; likewise the buyers will be reasonably sure of receiving grain which conforms to the grade requirements wherever they buy.

Up to the present time Federal grades have been fixed only for corn. The Federal corn grades and explanations of how they should be interpreted are explained in Department Bulletin No. 168.

The Federal corn grades became effective July 1, 1914, and have been adopted by practically all of the corn markets excepting those on the Atlantic seaboard, where they are still exporting under grades the rules of which contain such requirements as reasonably dry, reasonably clean, etc., which are incapable of uniform and definite interpretation.

The Federal corn grades have been in operation for over one year, and one of the noticeable results has been that the corn delivered to the country elevators the past year shows that the farmers are not only delivering corn that is cleaned, but they are also picking out the damaged ears, both of which tend to put the grain into a higher grade.

Since the factor of moisture content determines the commercial grade more frequently than any other factor during the first three or four months following a new harvest, the farmers are recognizing the value of storing their corn in properly constructed cribs built in such a way that the rain and snow are excluded, while good ventilation to facilitate the drying and prevent deterioration is provided.

FEEDING TESTS WITH DAMAGED CORN.

After moisture content the next most important factor which determines the grade of corn under the Federal grades is that of damaged kernels, maximum limits of which are provided for each grade. In fixing the limits of damaged kernels not only the averages found in corn as delivered at the country elevator were considered but feeding tests with different kinds of stock were carried on in cooperation with the Bureau of Animal Industry to determine its value in actual feeding value. The results showed that, other things being equal, the feeding value of corn depends directly upon its soundness. There was a large difference in the feeding value of sound and damaged corn. Chickens which were fed sound corn gained 150 per cent, while those which were fed "cob rotten" corn gained 98 per cent, and the chickens which were fed badly heat-damaged corn gained only 82 per cent in weight during the experiment.

The results with hogs, sheep, and other animals during this experiment showed in each case that the feeding value of corn decreased in proportion to its degree of damage.

The Federal corn grades provide definite maximum limits of the various factors such as damaged kernels; seeds, dirt, and foreign matter; and "cracked corn," which makes it necessary to secure an accurate representative sample for analysis. Investigations of the various methods and apparatus ordinarily used by the grain trade and inspection departments to reduce the original sample to a portion sufficiently small for convenient and rapid analyses disclosed the fact that there was no apparatus on the market which would do the dividing accurately enough for consistent results.

In order to provide a reliable mixing and sampling device for the determination of the proper grade of grain a special device was designed, which is fully described in Department Bulletin No. 287.

ADULTERATED AND DAMAGED EXPORTS.

Large quantities of grain are exported to Europe each year, and as the department has received numerous complaints concerning the unsatisfactory condition of the grain on arrival at the European ports, investigations were carried on to ascertain the actual conditions which existed. The investigations showed that a comparatively large percentage of the corn arrived in Europe in a heat-damaged condition, due to shipping in too damp a condition, to improper storage in the vessels, and to faulty construction of the vessels for carrying grain. Part of the results of these investigations, with recommendations, were published in Bureau of Plant Industry Circular 55. These investigations also showed that at times when barley was cheaper than oats export shipments of oats were found to contain heavy admixtures of barley. The condition became so serious that the Bureau of Chemistry, under the Food and Drugs Act, instituted several seizure actions, and the department issued a warning to the grain trade through the newspapers, under date of January 25, 1915, that the practice of adulterating oats with barley must cease.

The investigations likewise showed that when spring wheat was cheaper than durum wheat, or hard wheat was cheaper than soft wheat, heavy mixtures of the cheaper class of wheat were found in the shipments of the higher-priced wheats. Conditions such as these demonstrate the need of Government supervision of grain grading.

The Federal grades for commercial corn having been established, investigations are being directed more particularly to securing data upon which to base grades for wheat, oats, and the other grains.

GRADES FOR WHEAT AND RICE.

One of the important factors in establishing grades for wheat is the determination of the influence of foreign matter, including other grains, weed seeds, chaff, dirt, etc., on the milling and baking qualities of the wheat. In the sections producing spring wheat the wheat often contains a large amount of weed seeds and other foreign matter, and the wheat is graded after being cleaned with sieves that remove the greater part of the foreign matter, which is designated as "dockage" and expressed in terms of pounds per bushel. Certain impurities, such as rye, corn cockle, great ragweed, and wild vetch seed, are, on account of their shape, size, and specific gravity, practically inseparable, and when present in appreciable amounts injuriously affect the milling and baking qualities of the wheat. A manuscript has been prepared showing that the presence of more than 2 per cent of any of these so-called inseparable impurities in wheat when milled has a deleterious effect on the quantity of the bread.

The investigations so far completed, relating to the harvesting, handling, storing, and grading of rice, indicate that the milling quality of rough rice is in a large degree dependent upon the protection given the grain while in the shock from the variable weather conditions usually prevailing during the harvesting season.

Experiments to determine the breakage of rice indicate that only a very slight damage results from handling and shipping.

Factors considered in the commercial grading of rough rice and of clean rice are being studied with a view of fixing definite standard grades thereof.

Experiments made in the rice-producing section of the United States disprove the general opinion that a coating of glucose and talc preserves milled rice from attack by grain weevils.

A manuscript has been completed giving in detail information concerning the milling of rice and its mechanical and chemical effects upon the grain; and information concerning the type characteristics and commercial quality of milled rice imported into the United States is described in a manuscript now ready for publication.

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AIDING THE HOUSEKEEPER.

(Contribution from States Relations Service.)

It has sometimes been said that the Government does everything for the farm live stock and nothing for the farm family. No statement could be further from the truth, for the Government has always recognized the fact that agriculture and the home are closely connected and that the consideration of the one must include consideration of the other. A review of its activities will show that a great deal has been done by the Government, particularly in the Department of Agriculture, which benefits the housekeeper. Some of the product of its activities which applies particularly to the home has been accumulated in connection with the general work of the department, but a large amount has come from enterprises carried on for the specific purpose of studying the problems of the farm home.

Any work which aims to make the farm more profitable must be of value to the farm home also, because with greater profits comes the opportunity for better living, more conveniences and comforts in the home, and greater advantages for the family. Increased production of grains, dairy products, and live stock means not only increased revenue but an abundant and varied food supply for all our homes. In all such enterprises for agricultural improvement the department work has been ceaseless and untiring. The department also helps the farm housekeeper and every other housekeeper when it safeguards her food supply, as it does through its meat-inspection service and its pure-food work.

STUDY OF FOOD PROBLEMS.

Besides such activities as these, which are of great importance to the home maker, the department has carried on, for 20 years or more, work directly organized for the study of home problems, particularly those pertaining to food, its nature and properties, and the better and more economical use in the home of the products of farm, ranch, and garden. Very lately the scope of this work, which began with the study of food, has been broadened to include clothing, and household equipment and household labor, and in this connection it is worth remembering also that practically all the raw materials of clothing and household equipment (wool, cotton, linen, wood, etc.) come from the farm or from some other agricultural source. Under the reorganization recently effected in the depart-

ment this enterprise is called the Office of Home Economics, and is a part of the States Relations Service, one of the main subdivisions of the department.

STUDY IN HOME ECONOMICS.

In the past a great deal of attention has been paid to carrying the results of studies of food and nutrition directly to the housekeeper, chiefly by means of publications. That she has appreciated this is shown by the fact that to date over 15,000,000 copies of the Farmers' Bulletins on these topics have been needed to meet the demand for them. An even more direct means for carrying information to the home is offered by the extension activities and farm demonstration work for which the Smith-Lever Act so amply provides, work which is also centered in the States Relations Service. It is part of the new plan to so coordinate activities that problems are given preference in the Office of Home Economics which will give the extension workers an abundant supply of the data covering home problems needed for their work throughout the country. With the Office of Home Economics to collect information (not only by means of experiments undertaken for this purpose but also data secured from housekeepers and based on their experience) and with the great extension agencies to supplement other means of carrying information directly into the farm home, the women of the country may truly feel that their interests are receiving attention at the hands of the Government and that the study of their problems is not being neglected.

HOUSEKEEPERS' PROBLEMS THE SAME.

The majority of the housekeepers' problems are the same, whether the family lives in the country or the town, for all families must have food and clothing and a house furnished and equipped for the daily tasks and for the various activities which make up the work and pleasure of family life. It comes about, therefore, that although this work is designed particularly for the farm woman, it is not limited in the usefulness to the farm home, but extends to others also.

Thus the Government now has in effect a special agency for women's work which has so often been asked for. Men and women are working not only with the complex equipment of the modern laboratory but also with the utensils and appliances of the home in the study of a great variety of topics of interest to home makers and are doing all they can to help to make housekeeping easier and more interesting.

FOREST ACTIVITIES.

(Contribution from the Forest Service.)

In conformity with Memorandum No. 121 of the Secretary of Agriculture, a Branch of Research will be established in the Forest Service within the next two months. Its purpose is to bring together under one executive direction as many of the various lines of research or investigative work conducted by the Forest Service as practicable.

The work of the new branch will include all of the silvicultural investigations conducted by the Forest Service; the development of private forestry in the Eastern States; the Forest Products Laboratory at Madison, Wis.; the industrial and utilization investigations in forest products conducted at Washington and at various district headquarters; and the other economic investigations of the service, such as the study of the lumber industry now in progress, and studies of lumbering costs and methods, markets, etc., in connection with the administration of the national forests. The grazing studies will remain under the Branch of Grazing and will be handled in correlation with the other studies. It is the purpose of this change to develop and strengthen research work as a coordinate division of the Forest Service and to give the research work and personnel the fullest possible recognition.

The Forest Service scientific work is closely allied to that of the rest of the Department of Agriculture, not only because forests are a product of the soil, subject to the same laws and presenting problems in many respects parallel with those relating to the production of field crops, but also because their management ties in at many points with the agricultural interests of the country. In the case of the farm wood lot the relation is self-evident. The timber is merely one of the farm crops and must be recognized as such in any general scheme of farm management. In the West the national forests are important adjuncts to agricultural development both because of their relation to water and timber supplies and because of the extent to which use of the forest range increases the opportunity for profitable farming. The central object of the investigative work of the forest is to develop knowledge which will promote larger and better use of lands suitable for the production of forest crops and better use of the material yielded by these lands. In pursuing these ends the advantage of close correlation with other similar work of the department is evident.

The new Branch of Research is organized with a view to better correlation, both internal and external, of the various investigative lines, and also with a view to better recognition of the fundamental nature of the investigative work. Within the last few

years both the Forest Service program of research projects and the facilities for carrying them on have greatly broadened. There are now eight forest experiment stations, while a well-equipped forest-products laboratory is maintained at Madison, Wis. Grazing studies are conducted at a grazing experiment station on one of the national forests in Utah and on several other forests. But meager data are available in this country upon which to base the proper handling of the forest and range, since the practice and science of forestry developed in the older countries are of little direct value because of differences in species and in climatic and economic conditions.

The investigations will continue to be classified as dendrological, grazing, products, and silvicultural studies. The dendrological studies aim to secure information concerning the distinguishing characteristics and the geographical distribution of North American trees and shrubs. They also include investigations of the gross and microscopic structure of the woods of the more important North American and foreign timber trees as a means of identification. The aim of the grazing investigations is to secure thorough scientific information leading to (1) the production of the maximum value of forage crops; (2) the utilization of timbered areas and areas above timber line by grazing without destroying the protective value of the vegetative cover; (3) securing the greatest efficiency per unit area in utilizing the forage available for use. The products investigations deal with the properties and suitability for different purposes of various tree species and kinds of forest products; secure data on the amounts, prices, sources, and uses of various forest products produced annually; and aim to discover where and how waste occurs and how it may be reduced.

The silvicultural studies seek a thorough knowledge both of the silvical characteristics and requirements of all forest trees—necessary as a scientific basis for the proper handling and most economical use of existing forests and for the establishment of new forests—and of the indirect benefits due to forest influences.

Thus a close analogy is disclosed between the problems confronting the forester and the plant investigator. The study of forest types brought out practically the same relationship between forest cover and the climatic and physical conditions of its growth as the studies of plant associations. The studies of the factors affecting the appearance of natural reproduction after cutting are essentially plant ecological studies, and the whole field of silviculture in reality is nothing but applied plant ecology. The tree planting, especially in the semiarid Southwest and the prairie region, has brought to the front problems similar to those faced by the dry-farming agriculturist in the

same regions. The grazing studies are largely botanical studies closely related to the agrostological studies of the Bureau of Plant Industry. The important field of the influence of the forest upon stream flow and climate of the adjoining areas is intimately connected with meteorology, of which it forms an integral part. The industrial and statistical investigations are practically statistical market investigations of forest products and are practically of the same nature as the crop estimates and market studies of agricultural products.

The study of the physical and mechanical properties of timber is very much in line with a similar study of the other vegetable substances conducted by the Bureau of Chemistry and other bureaus in the department. So throughout the entire field of Forest Service investigations there are many points of contact between the forest problems and other agricultural problems of the department, to say nothing about forest entomology and forest pathology, which are, of course, handled by the Bureau of Entomology and the Office of Forest Pathology, of the Bureau of Plant Industry, respectively, in cooperation with the Forest Service. An exchange of opinions between the men engaged in investigative work in the Forest Service with those in other bureaus can therefore be but mutually beneficial.

MOVABLE SCHOOL WORK.

A prominent feature of extension work in the Northern and Western States in both agriculture and home economics has been the movable schools of from three to five days' duration. The instructional work given has been usually of a very practical nature, accompanied often by demonstrations by the instructor. The unfortunate feature of this school work is the frequent failure of the schools to provide opportunity for the students themselves to take part in the actual handling of apparatus and the actual demonstration work. However, more to be regretted, perhaps, than this is the very common lack of follow-up work after the school is over to see that the subject matter taught is actually put into practice on the farm and in the farm homes. Without this follow-up work movable school teaching differs but little from and is likely to be not much more effective than the old-time "talking farmers' institutes." The present conception of extension work differs from the old primarily in this, that action terminating in better rural practices that can be seen and measured shall follow as a result of the teaching, otherwise the teaching has not reached its maximum achievement. Follow-up work in movable schools is as essential as it is in boys and girls' club work, if results commensurate with the cost are to be secured—Farm Demonstration Monthly, July, 1915.

PLANT INTRODUCTION.

(Contribution from Bureau of Plant Industry.)

Into the inspection room of the Federal Horticultural Board come, through the operations of the Office of Foreign Seed and Plant Introduction, packages from the remotest corners of the world.

On June 1, for example, a package was opened, in the presence of inspectors, from the Director of Agriculture of Paramaribo, containing six samples of rice, each with the Malay name attached to it (Paramaribo is in the Dutch colony of Suriname and the laborers are imported from Java); a package from Bangalore containing five packages of rice, each with its Hindustani name, which the Director of the Mysore Government Gardens had sent in; and another package, postmarked Zaria, containing two varieties of sorghums and one of pearl millet, sent by the Director of the Department of Agriculture of Northern Nigeria. Each one of these varieties of grain constitutes an introduction and is the result of correspondence for which some exchange of American seeds or plants has been made.

While foreign official channels constitute an important source through which new plants are brought in, thousands of letters pass each year between the Office of Foreign Seed and Plant Introduction and our diplomatic and consular officials abroad, missionaries, travelers, botanical collectors, and resident amateur plant lovers all over the world.

In addition to this important source through which new seeds and plants are secured, the office has its own trained agricultural explorers who travel through foreign countries studying the crops and wild plants. Being familiar with what we already have, they are able to pick out such of the foreign crop plants as are not grown here and predict with more or less certainty their chances of success in America.

Each new introduction is numbered with a distinctive serial number which it carries wherever it is tested and as long as it is of value. This number will at any time identify the introduction and tie it up to the information regarding its source, name, method of culture, or the uses to which it may be put; and as all of this information is printed in the Inventories of Plants Imported by the Office, it becomes possible many years after a new tree, for example, is introduced to give a connected history of its introduction into America and enable an explorer to see the original tree or at least the orchard in the foreign

country from which the seeds or buds came.

Every sample of seed, every potted plant, every cutting or bud stick which comes in is subjected to the scrutiny of the inspectors, and those harboring parasites of any kind which might cause trouble if introduced are either destroyed or subjected to disinfection and months of watching in specially screened quarantine greenhouses far removed from the areas of cultivation which would be endangered should the parasites escape.

Every month important arrivals are chronicled in more or less technical language in advance sheets of information which are sent to the State experiment stations and to bona fide plant specialists and amateurs who have the facilities and the desire to test these new and as yet untried plant possibilities.

As information in regard to the raising of trees or shrubs from seeds is possessed by but few people, comparatively little tree or shrub seed is sent out for trial. Instead, these seeds are sent to our field stations for propagation, and later, when the resulting small plants are ready, they are sent out as potted or nursery dug plants, in good shape to stand an amount of neglect which, as seeds, they could not endure.

There is more mystery than necessary surrounding the sending of a plant by mail. If properly packed, sent at the right time and kept cool, bud sticks from which cuttings or buds can be taken can be sent half way round the world, or from the Cape of Good Hope to Lower California. Printed simple directions, with illustrations to assist in making them clearer, are sent out to correspondents abroad, and these have facilitated the collection of clean material and its safe arrival in this country. Special arrangements with steamship companies have also been made so that plants bearing the special instruction tags of the Office of Foreign Seed and Plant Introduction are given a cool place on the steamer, which, it has been found, increases the percentage of successful shipments, especially on long voyages across the Equator.

As periods of years often elapse between the first arrival of a new introduction and its fruiting out in this country, photographs of it in its home form an important part of the record of its introduction.

With many of the new things coming in, no more is necessary than to put them into the State experiment station machinery for variety testing to find out whether they are better or not so good as varieties already here. In time, our specialists ought to come to appreciate the fact that through these trials we

have the best varieties of their kind in the world—we will have the best of everything that is suited to our climate and soil conditions. With many other introductions which represent entirely new industries, there is no machinery for their development in this country, and special experimenters have to be set to work upon them to ascertain what is required, bring the information together, get up a sufficient stock of plants, arouse interest, and bring the introduction up to a point where commercial men will see the possibilities of making money out of its exploitation. This work and the work of propagation require field stations, four of which are running in different parts of the country and contain already remarkable collections of new plants. One is at Chico, Cal.; one at Miami, Fla.; one at Brooksville, Fla.; and one near Rockville, Md.

The relations between this work and the nursery trade are the best possible. It costs too much to advertise an entirely new plant no matter how valuable it is, and the nursery companies feel that they need all the help they can get in the way of publicity, the distribution of free plants, and the investigation of their new parasites, and they will put the plants on the market for sale after the Government has withdrawn its support and no longer sends the new plants out gratis.

Once a year, beginning in December, the catalogue of new plants for trial is sent out, and upon the applications received from this catalogue and the data furnished to prove that the applicants are more or less experienced plant cultivators and experimenters, the stock of new plants is sent out, each plant kind properly tagged with 50-word descriptive tags, which will last two years, or until the recipient interested in each plant has stamped its identity on his mind.

Reports are required on these plants and inspectors sent to see the most successful and important ones. Forty thousand introductions have been made and distributed to thousands of people in this country.

About 19 per cent of the wheat crop of the United States is harvested in June, 46 per cent in July, and 35 per cent in August. The harvest over the entire world may be said to begin in December in Australia and South America; in February the harvest is practically over there, but begins in India and runs through April. Very little wheat is harvested anywhere in May, but in June the people of southern Europe begin to get in their crops. By September practically all the wheat in the world has been harvested.

MICROBIOLOGY.

(Contribution from the Bureau of Chemistry.)

The Laboratory of Microbiology, organized in the Bureau of Chemistry on April 1, 1915, has taken over all the work of the bureau relating to the activities of microorganisms. This includes both fungi and bacteria, and will in a short time include certain fermentation investigations. The activities of various microorganisms are closely related to much of the work of the Bureau of Chemistry, especially to that part of the work having to do with foods and feeding stuffs, and involves both research problems and those arising in the enforcement of the Food and Drugs Act.

In order to make a clear separation of the regulatory functions and the research functions, there has been included in the Laboratory of Microbiology a section of inspection microbiology. To this section is assigned all the strictly regulatory work. The personnel of this section devote their entire time to the inspection work and problems directly connected with it. This section does the bacteriological work in connection with the enforcement of the Food and Drugs Act that was formerly done in the Bacteriological Laboratory. That laboratory was abolished at the time of the organization of the Laboratory of Microbiology, and the personnel transferred to the inspection section of the newly organized laboratory.

The research problems of the Microbiological Laboratory will be handled by workers who devote their whole time and energy to the investigational work. Thus the regulatory work will be done exclusively by one set of workers, and the research work exclusively by another set of men.

By bringing both of these lines of work under the general direction of one man, however, it is hoped to make the experience of the law-enforcement laboratory shed direct light upon the studies of the research group, and vice versa. Setting some workers free from the pressure of inspection work, although in close relation to it, will make it possible to standardize the methods of attack, and put information from both lines into practical use.

Among topics of an investigational character, the Bacteriological Laboratory had for several years conducted a sanitary survey of the oyster industry. This included the examination of the oyster beds, the study of the handling and shipping operations, and the condition of the product as offered to the consumer. The handling of oysters has in many respects been revolutionized by this work. This work will be continued during the coming year. Similar service has been rendered to several other industries.

The activities of microorganisms are important in connection with a whole series of problems which are charged to the various

laboratories of the bureau. Consultations or letters of inquiry range widely from the organisms of tanning to those of sugar or of tobacco, or to pathogenic molds. On the other hand, the principal service of the laboratory is to be sought in the thorough study of large problems, some of which have already been made department projects. One of these is the participation of molds and bacteria in the spoilage of feeding stuffs. This is linked with the constant association of such feeds with the so-called "forage poisoning" of stock, especially horses. These losses occur over the whole country, and the feed suspected varies from grass upon the range to spoiled ensilage. Unfortunately no one has been able to produce these cases under experimental control. It is therefore exceedingly desirable that certain feeding stuffs be selected and thoroughly studied to find out if there is any real connection between spoiled feed and these losses.

Another field of much interest is the deterioration of human food in storage. Work has been started upon cereals, especially corn meal, which seems to spoil rapidly under some conditions. To define those conditions and the relation of particular microorganisms to the process has been made another department project. The bearing of this work upon the safety of such materials as food can not be estimated in advance.

Similarly, there is a group of foods into which the organisms of fermentation enter as a factor, either good or bad. These will form another group of projects. These embrace the activities of yeast and the bacteria which accompany them in bread, fruit juices, pickles, sauerkraut, etc. The ramifications of such a piece of work will lead in many directions.

Ultimately most of these pieces of work get back to the one basal idea. We can not get away from constant association with many species of microorganisms, so we must study the organisms themselves until we can control them.

GRAIN STANDARDIZATION.

(Continued from page 5.)

In addition to those methods and apparatus already mentioned, which have been developed for the rapid and accurate testing of grain, can be mentioned a simple method of detecting sulphured barley and oats, described in Bureau of Plant Industry Circular 40; a method for the determination of the specific gravity of wheat and other cereals, described in Bureau of Plant Industry Circular 99; an improved apparatus for detecting sulphured grain, described in Bureau of Plant Industry Circular 11; and a special flask for the rapid determination of water in flour and meal, described in Department Bulletin No. 56.

EASTERN INSECT STATION.

(Contribution from the Bureau of Entomology.)

The eastern field station of the Branch of Forest Insects, Bureau of Entomology, was established in 1912 at East Falls Church, Va.

The station as at present organized occupies two leased private dwellings, one of which is located on about one-half acre of ground on Cedar Street, East Falls Church, and the other is just outside the corporation line of East Falls Church, near a wood lot, and includes about an acre and a half of ground. The houses are used as laboratory and office quarters and are equipped with the necessary furniture and apparatus, including a photographic outfit, for the study of all phases of forest and shade tree insect life.

In addition to these buildings there are four outdoor insectaries. These are temporary frame structures, 16 by 18 feet, equipped with new and improved types of rearing cages. One insectary is used for the rearing of forest Lepidoptera (moths and butterflies); another for forest Hymenoptera (sawflies, ants, parasitic wasps, bees, etc.) and forest Diptera (two-winged flies), and another for forest Coleoptera (beetles), while a fourth is designed for the special purpose of carrying on experiments in the prevention and control of damage by wood-boring insects to crude forest products.

A plantation of young forest trees has been established which at present includes 2,800 plants, representing 22 species of conifers and 8 species of hardwoods. The object of this plantation is to have immediately available the various species of trees on which to conduct studies under natural conditions on the seasonal history and habits of the insects affecting them.

The principal work at the station is the investigation of the seasonal history of insects which are injurious or beneficial to forest and shade trees and to crude and finished forest products and the methods of control and prevention of damage of the injurious species. The material collected in the field and sent in from other stations and practically all of the immature stages of insects received at the Washington office in connection with correspondence are forwarded to this station for rearing and study.

During the past year more than 2,500 rearing and other experiments have been under observation, and approximately 10,000 specimens have been reared and studied at this station. At present special studies are being made by the specialist on forest Lepidoptera of the European pine-shoot moth to determine new facts in connection with its seasonal history and habits in its new environment. This insect, which is so injurious to conifers in Europe, has recently found its

way into this country in imported nursery stock and is becoming established in many localities in the Eastern States. The powder-post beetles, which are so destructive to seasoned hardwood products, have been the subject of exhaustive study and experiments to determine their seasonal history and the most practical preventive and control methods. Exhaustive experiments have also been under way since the establishment of the station with all of the more important wood preservatives to determine their relative value in protecting all of the common native and many of the tropical woods from attack by white ants, or termites, and other wood-boring insects. These have already yielded some valuable results which are being put into practice by telegraph, telephone, mining, and other large timber-using concerns in the country.

The work at this station should be of special interest to economic entomologists, foresters, arboriculturists, owners of wood lots, manufacturers of forest products, etc., because of the many new methods of study and experimentation devised and the demonstration of methods of prevention and control which are of immediate practical value in avoiding the extensive losses and waste of forest resources and the serious damage to shade trees and ornamental shrubs caused by insects.

FOOD REGULATIONS.

(Contribution from the Bureau of Chemistry.)

The fourteenth number of the Service and Regulatory Announcements of the Bureau of Chemistry contains letters 125 to 138, inclusive, and treats of the following subjects: Extending time for the use of labels under the conditions prescribed in letter 49, S. R. A., Chem. 6, p. 417; notice to importers regarding relabeling; notice to dealers in and packers of sorghum sirup; the use of lactic acid in food products; the use of artificial color in alimentary pastes; use of the terms potato flour, rice flour, cassava flour, and tapioca flour; wormy and fly-infested horse beans; unpolished and uncoated rice; smutty barley; method of determining "cut-out" weights of canned oysters and clams; tentative standards for marjoram leaves and thyme leaves; use of *Sinapis* (*Brassica*) *cernua* in mustard preparations; the labeling of substandard drugs; blackberry cordial; cinchona (China) bitters; Buchu gin; list and location of branch food and drug inspection laboratories of the Bureau of Chemistry; and list of State, dairy, food, drug, and feeding-stuffs officials.

Among the decisions of importance may be mentioned the extension of time for the use of labels printed prior to the issu-

ance of Food Inspection Decision 154, if the net contents are correctly stated under the conditions given in letter 49. According to the terms of this decision the department will not, prior to January 1, 1916, recommend proceedings solely upon the charge that the statement of quantity of contents on the package, if otherwise satisfactory, is not in terms of the largest unit in the package, provided that upon investigation it is found that the labels or cartons bearing such statements were printed prior to May 11, 1914, and plainly indicate an honest attempt to comply with the provisions of the law.

Another decision expresses the opinion that the use of artificial color in macaroni, spaghetti, vermicelli, noodles, and similar alimentary pastes usually constitutes adulteration. It is the opinion of the bureau that the addition of artificial color to alimentary pastes as usually practiced results in concealing inferiority and that this form of adulteration can not be corrected by the declaration on the label of the artificial color.

A SUCCESSFUL FARMERS' MEETING.

County agents in their weekly reports frequently mention having attended and addressed a "successful farmers' meeting." Success is sometimes measured by the attendance, a large attendance and manifest interest in the subjects discussed being taken as indications of success. These factors may be misleading. The speaker's own interest and enthusiasm in his subject may lead him to overestimate the effect upon the audience. A successful farmers' meeting is one which so impresses the audience that it results in actual concrete action on the part of the farmers. The measure of success of any meeting should be results. In order to bring this about the program should not attempt to cover the whole field of agriculture, but should be limited to some particular phase of agriculture, such as alfalfa, potatoes, etc., and thoroughly cover that phase. The point is so to concentrate attention upon one topic that an impression will be made, and then follow up with a definite program for putting into practice in the field the lessons of the lecture room. If before the meeting is adjourned, and while interest is at the maximum, the farmers can actually be pledged to do a definite line of work in cooperation with the agent, the way will then be open for follow-up-work at the proper season, which should result in the actual doing of the things which were recommended at the meeting. This, then, would entitle the meeting to be spoken of as a "successful one."—Farm Demonstration Monthly, July, 1915.

MAILING TO FOREIGN LISTS.

(Contribution from Division of Publications.)

The regulations of the department with regard to the sending of publications to foreign countries and the exact method of procedure in handling the distribution are not generally known nor understood by officials and employees of the department. It seems desirable, therefore, as a matter of information, to recite briefly the method in vogue, which method is in accordance with paragraphs 129 to 134 of the Administrative Regulations of July 1, 1914.

All publications to foreign addresses are distributed through the document section of the Division of Publications. The distribution may be classed as follows:

1. That to the regular mailing lists of the various bureaus, divisions, and offices which is automatically sent upon receipt of publications from the Public Printer, either by mail from this department or through the International Exchange of the Smithsonian Institution.

2. That mailed in response to individual requests issued by the various bureaus, divisions, and offices, each of which has a certain number of foreign mailing authorizations allotted for each month.

The mail dispatched through the International Exchange comprises packages in excess of 4 pounds 8 ounces in weight and such other packages as it has been found most economical to forward in this way.

Mail is at present dispatched through the International Exchange to all foreign countries except the following: Algeria, Belgium, Germany, German provinces, Hungary, Montenegro, Russia, Roumania, Serbia, and Turkey. Certain foreign mail, the prompt delivery of which is imperative, is dispatched under postage to all countries.

Special duplicate order blanks for such requests are furnished by the document section. The original, showing the postage required in mailing and the date that the publications are actually mailed, is returned to the issuing office, so that it may be filed with the correspondence concerning it, while the carbon copy is retained in the Division of Publications as a part of its records. The number of authorizations for mailing foreign publications allotted to bureaus, divisions, and offices is fixed by the regulations, which also limit the number of addresses on the various bureau and office mailing lists. These various lists are under the general supervision of the librarian of the department, the object of the supervision being to prevent duplication and to obtain exchanges. The foreign mailing lists for general publications, such as the Yearbook and the Farmers' Bulletins, also the mailing list of institutions which receive all

the publications of the department, are in direct charge of the librarian of the department.

The foreign letters requesting publications are referred to the library of the department, which office is authorized to determine whether the applicants are entitled to receive the publications free. All requests of applicants who are not rendering some service to the department, by exchange of publications, or courtesies, or otherwise, and are therefore not entitled under the regulations to receive them without cost, are referred to the Division of Publications, the chief of which informs the applicants in regard to the possibility of purchase of the publications from the Superintendent of Documents.

WEATHER REVIEW NOTES.

(Contribution from the Weather Bureau.)

Rainfall in the West.—Mr. B. C. Wallis contributes to the Monthly Weather Review for April, 1915 (pp. 170-178) an analysis of the rainfall over the United States west of the one hundredth meridian. This is the complement of his similar study of the rainfall of the eastern United States, which appeared in the January Review.

Mr. Wallis studies the rainfall of this country according to its "intensity," or the relation of the actual monthly fall to an ideal monthly fall, supposed to be one-twelfth of the actual annual fall. He divides the country into regions of similar rainfall character, presents maps showing the boundaries of these regions, prepares curves of the peculiarities of each of the regions through the year, and finally indicates the rainfall intensities over the country month by month on 12 maps.

For those who need to study the rainfall by political rather than natural boundaries, a final chapter subdivides the whole United States into 12 sections whose boundaries are approximately political. Throughout each of these sections the rainfall character is in fair agreement with that of its "rainfall center;" even here the section boundaries must sometimes cross political ones.

The study brings out the interesting relationship between total annual precipitation and the range of "rainfall intensity," illustrating the diversity of the rainfall conditions of the United States.

The moon's influence.—In furtherance of the aims of the department to issue correct information on all subjects bear-

ing upon agriculture, the Monthly Weather Review for April, 1915, offers (pp. 179-182) the results of logical and fair-minded studies by Dr. V. Köppen into possible relations between the moon and terrestrial weather. The most obvious and logical line along which the moon might exert a real, not an occult or a magic, influence is that of the atmospheric pressure changes from day to day and week to week. It is known that the moon exerts a pull of hundreds of tons upon the rigid earth, and it must exert some pull upon the fluid atmosphere. Dr. Köppen has carefully investigated records of atmospheric pressure extending from 1750 down to the present, with the result that he finds it impossible to identify any lunar regularities in the pressure changes which have been recorded hour by hour for generations. Man has not observed through a period long enough to reveal to him a consistent periodical change in pressure due to the moon. If this can not be established from the most delicate observations we possess, why look for resultant coarser weather periods?

A related paper (p. 182) summarizes a memoir by Dr. Wagner, who has traced the development of this belief in lunar and planetary weather influences. A study of these contributions will help to a proper understanding of what the moon can and can not do to the weather of the globe.

The climatic factor.—In the Monthly Weather Review for March, Prof. W. J. Humphreys reviews E. Huntington's elaborate volume, "The Climatic Factor." Prof. Humphreys discusses in detail the more significant climatological points made by Dr. Huntington and his collaborators and shows that all of the conclusions reached are still decidedly not raised above the grade of hypotheses. Concerning "the shift of the storm track," it is of particular value to learn that by reason of variations in the nature of the evidence adduced no shift can possibly be established as yet.

The index section, Division of Publications, reports that the notice which appeared on page 3 of the first issue of the Circular brought a number of inquiries from persons in the service who did not know that such an index as is being maintained by the section was in existence. Two or three who have been seeking such aid and have been attempting to keep up some such index within their own fields have visited the office to see the index and to understand its scope and purpose. This key to the department publications is accessible to all workers in the various fields.

AIM OF THE COTTON ACT.*(Continued from page 1.)*

low-grade and inferior cotton shall not be delivered; written notice of the date of delivery shall be given on the fifth business day prior to delivery, and advance written notice or certificate stating the grade and marks or numbers of each individual bale to be delivered; and a dispute as to the grade, quality, or length of staple of cotton tendered may be referred to the Secretary of Agriculture for determination, his findings to be accepted in Federal courts as prima facie evidence.

Inasmuch as a practically prohibitive tax is imposed on all exchange future contracts other than those complying with the conditions prescribed for exemptions the constitutionality of the act has been questioned.

The statute imposes an excise tax on the privilege of doing business on exchanges. It does not impose a tax on cotton itself or on any sale of spot cotton. Hence, it does not violate the constitutional requirement that direct taxes be apportioned according to the population. It is a mere application of the super-tax principle illustrated by the oleomargarine act.

The tax is imposed on a particular class of business, done only on cotton exchanges. Nevertheless, this does not violate any constitutional prohibition against discriminations. Congress has power to classify for purposes of taxation; the line drawn in the statute between transactions which are and transactions which are not taxed is reasonable, and the courts will not interfere with the exercise by Congress of its judgment on that subject. Neither does the act violate the requirement of uniformity contained in the taxing clause of the Constitution, because that refers only to geographical uniformity. The act affects its subject matter in the same manner wherever found throughout the United States. Likewise, legislative power is not delegated. Certain administrative duties only are imposed on the Secretaries of the Treasury and of Agriculture which are essential in carrying out the purposes of the statute and embrace details Congress could not itself properly handle.

In requiring that the findings of the Secretary of Agriculture upon disputes referred to him shall be accepted in Federal courts as prima facie evidence, Congress exercised a long-recognized legislative power, which in no sense deprives of the right of trial by jury.

The severity of the penalties imposed does not invalidate the act, under the due-process clause of the fifth amend-

ment of the Constitution, because Congress has dealt expressly and fully with a matter over which its jurisdiction is complete. Moreover, if one be deprived of property through the exercise by Congress of an enumerated power, that would be due process.

Had Congress dealt only with domestic exchanges, injustice would have been done to them, and the act might easily have been evaded. Therefore section 11, in substance, taxes orders transmitted abroad for the making on foreign exchanges of contracts of sale for future delivery of American cotton, if such contracts be not made in one of two prescribed forms, substantially the same as the contracts on domestic exchanges which the statute exempts from taxation. No tax is laid on articles exported from any State, but a mere excise is imposed on the privilege of transmitting orders abroad for execution. It is not imposed on facilities without which exportation ordinarily could not occur.

The act did not originate in the Senate in contravention of the constitutional provision that revenue bills shall originate in the House. The facts are that there was introduced in and passed by the Senate a bill, known as S. 110, framed primarily under the post office and post roads and incidentally under the commerce clause, which did not propose the raising of revenue. In the House the entire Senate bill, except the enacting clause and the number, was stricken out and a House bill substituted which did provide for raising revenue. This House bill, with slight amendments, as reported by a conference committee, was enacted by both houses, and is the cotton-futures act.

While experience may demonstrate that this statute should be altered in some respects, a dispassionate examination of its legislative history can hardly fail to create three impressions: First, Congress has made an honest effort to do justice to all; second, if the evils at which the statute is aimed persist, and can not be eliminated by amendment, eventually the business of dealing in cotton futures will have to be carried on otherwise than upon exchanges; third, in its present temper Congress is determined to exercise its undoubted power to destroy the exchanges rather than see its deliberately expressed judgment thwarted by subterfuge or evasion.

The act has been in full effect only since February 18, 1915, has given widespread satisfaction, and has been little opposed. Up to June 30, 1915, only 703 disputes, involving a little under 45,000 bales, were filed, a number which might have been less if the exchange from

which they came had given full force to the work of its classification committee. This failure will probably be corrected in time.

Additional legislation, in substance requiring cotton shipped in interstate and foreign commerce to comply with the official standards established by the Secretary of Agriculture, covered by a so-called cotton-standards bill, was favorably reported by the House Committee on Agriculture last year. If enacted, this would strengthen the cotton-futures act, and the two together would probably go far toward bringing about world-wide uniformity in standards of American cotton.

The act is an attempt to eradicate injustice and is framed in the interest of all. It seeks to revive genuine, unfettered competition; to give a free market to the makers and to the users of cotton. Though it prove defective in details, because of its motive it will be a benefaction both to the exchanges and to the public.

NEW JOURNAL.*(Contribution from the Bureau of Chemistry.)*

The Association of Official Agricultural Chemists has made arrangements for the publication of a quarterly journal, the first number of which will shortly be issued. This journal, which will be called the Journal of the Association of Official Agricultural Chemists, will contain the proceedings of the association, methods of analysis of various products, and reports of investigations of value to food, drug, feed-control, and agricultural chemists.

The proceedings of this association, together with the provisional and official methods of analysis, were formerly published by the Department of Agriculture, but the work of the association has grown to such an extent that it was decided at the last meeting of the association to publish an independent journal. The Association of Official Agricultural Chemists was organized to secure uniformity and accuracy in the methods, results, and modes of statement of analysis of fertilizers, soils, cattle food, dairy products, human foods, medicinal plants, drugs, and other materials connected with the agricultural industry. Its membership consists of analytical chemists connected with the United States Department of Agriculture, and with State and Federal agricultural experiment stations and agricultural colleges, and other institutions charged with the official control of any of the above-mentioned products. Inquiries regarding the new journal should be sent to the Secretary of the Association, Dr. Carl L. Alsberg, care of Bureau of Chemistry.

WEATHER BUREAU ITEMS.

(Contribution from the Weather Bureau.)

Libraries at Weather Bureau stations.—It is perhaps not generally known to meteorologists outside the Weather Bureau, or to scientific workers in general, that, in addition to the main library at the central office in Washington, the Weather Bureau maintains libraries at practically all of its local offices, about 200 in number, scattered throughout the country.

These station libraries are supplied with more or less complete files of the publications of the bureau, as well as with many unofficial works on meteorology and closely allied sciences. The size of the libraries depends upon the size and importance of the local offices at which they are established, stations in the larger cities and the various climatological section centers having libraries of considerable size. The local office in Chicago, in particular, is supplied with a strong and important collection of meteorological literature, which is continually being enlarged in size and scope.

All of the stations receive currently the Quarterly Journal of the Royal Meteorological Society, copies of this publication being circulated over a number of prescribed routes and ultimately deposited at certain specified stations, where they are bound and preserved. Copies of the *Meteorologische Zeitschrift* are circulated, in the same manner, to stations at which officials and employees are able to read scientific German, and about 40 such stations are furnished with the publications of the International Commission for Scientific Aeronautics, these also being mainly in German.

These libraries are open during office hours to all persons desiring to use them for any serious scientific study or for reference purposes.

New precipitation charts for the United States.—Rainfall measurements have been made at a few places in the eastern United States for more than 100 years, and in other portions observations for the past 50 years are available at scattered points. For shorter periods the number rapidly increases, until at the present time daily measurements are being made at more than 4,500 stations well distributed over the country.

On account of the lack of sufficient observations in the more western portions of the country, it has been impossible until recently to prepare satisfactory charts showing the distribution of the precipitation as accurately as necessary for the growing needs of the various investigators studying the undeveloped re-

sources of the country as affected by the water supply.

With a view of supplying this information with as much accuracy as is now possible, the Weather Bureau is preparing for publication in a proposed atlas of agricultural meteorology a series of charts showing the distribution of the precipitation over all portions of the United States for the 20-year period 1895 to 1914, inclusive.

In charting means of climatic values for presentation in graphic form, unsatisfactory results are evidenced when the data are based on varying periods of observations. To overcome this difficulty and at the same time provide data for every section of the country comparable with every other section, the results from about 3,000 stations, having records of from 5 to 20 years during the period 1895 to 1914, are being reduced to the uniform 20-year period.

The reduction of the shorter records to the full period is being accomplished by comparison of the ratios that the short-record stations bear to the long-record stations for identical years, and these ratios are then applied to the short records to reduce them to the full period. By this means the inequalities due to abnormal variations in rainfall for a single month or year, which automatically disappear in the long records, are largely eliminated from the short-term records, and the resulting values bear the ratios to the long-record stations that would exist had the observations been continuous through the entire period at all stations.

Upper-air investigations.—During July, 1914, the Weather Bureau co-operated with the Smithsonian Institution in obtaining pyr heliometric observations at great altitudes. One pyr heliometer returned an excellent record from a height of 25 kilometers. This record has been reduced, and a preliminary report of the results has been published in a recent report of the field work of the Smithsonian Institution.

By arrangement with the Signal Corps of the United States Army, use is being made by the Weather Bureau of the stationary aeronautical equipment at Fort Omaha. This equipment, especially the hydrogen gas plant, is of great value in the bureau's sounding balloon work.

Through the courtesy of the Coast Guard Service of the Treasury Department, the Weather Bureau has secured valuable upper-air data over parts of the North Atlantic covered by the cruises of the Coast Guard cutter *Seneca* in May and June, 1915. Twenty-eight kite flights were made from the deck of the *Seneca* during these two cruises.

ANIMAL INDUSTRY BRIEFS.

(Contribution from Bureau of Animal Industry.)

The alcohol test for milk.—A study of the alcohol test in relation to milk, the results of which are reported in Department Bulletin No. 202, has been made by S. Henry Ayers and William T. Johnson, jr., of the Dairy Division. This test as generally used consists in mixing equal volumes of alcohol and milk, and when a coagulum or precipitate is produced it is considered positive and denotes some abnormality in the milk. The alcohol test is used for practical purposes in some European countries. For instance, a Berlin police regulation of 1902 required that cow's milk coming from a distance must, at the time of delivery to the consumer, stand the test. Similarly, it is reported that only such fresh milk is accepted in the Vienna market as shows no precipitate, or only a very fine coagulation, when subjected to the alcohol test. The main object in this work was to determine the practical value of the test as applied to the quality of ordinary market milk. The result failed to show that the test was of any particular value in the control of a market milk supply except as a means of evidence that milk from a particular source was abnormal in some way and should be examined by other tests. The alcohol test, the bulletin states, might be of value at a receiving station as a means of detecting sour milk, but it would be expensive as compared with the use of alkaline tablets for the rapid determination of acidity.

The woolgrower and the wool trade.—The industries connected with the manufacture and production of wool are among the most important in the United States. During the past year (1914) the imports of unmanufactured wool amounted, in round figures, to 257,000,000 pounds, and the home-grown clip was not much less than this total, according to Department Bulletin No. 206, by Messrs. Marshall and Heller, of the Animal Husbandry Division. It states, however, that while some American wools are equal to the best foreign, on the whole their appearance compares quite unfavorably with that of most of the foreign wool. This difference is due nearly altogether to the growers' methods of preparing the wool for shipment. Persons familiar with the buying and manufacturing of home-grown and foreign wools say that on account of poor preparation American wools net the growers from 1 to 3 cents a pound less than their actual value. The factors that contribute to this handicap are, chiefly, the failure to classify the

wool before selling and, in lesser degree, defects from the use of improper twine, branding paints, and other minor causes. Most of the work necessary to place our wools on a parity with the foreign can be done at the time of shearing.

The bulletin is compact in form, well illustrated, and contains a glossary of terms used in the wool trade. Among a number of other features, it deals with the present methods of our woolgrowers, the need of improvement, and advises how such improvement may be brought about.

Phosphorus in food products.—An improved method for the estimation of inorganic phosphoric acid in certain tissues and food products is described in a paper by Robert M. Chapin and Wilmer C. Powick, of the Biochemic Division, published in the *Journal of Biological Chemistry* (Vol. XX, No. 2). The new method involves the employment of picric acid. It should be mentioned, however, that since the publication of the paper it became known that another investigator (Greenwald) had also used picric acid. This is subsequently acknowledged in a correctional note by the authors, with the remark that their experimental work with eggs was executed the year before the publication of Greenwald's report.

The several methods known to the authors to have been previously employed were all open to certain objections and shortcomings, which are pointed out and the advantages of the improved method briefly summarized. Experimental work was carried on with eggs and meat (beef), in which the new method and its several modifications were tested and found to be rapid and accurate.

Disinfection of hides.—The April number of the *Journal of Agricultural Research* contains a paper entitled "A Bacteriological Study of Methods for the Disinfection of Hides Infected with Anthrax Spores," by Dr. Tilley, of the Biochemic Division. Millions of hides and skins are annually imported into the United States from all quarters of the globe, hence a satisfactory method of disinfecting them to prevent the introduction of disease is a prime necessity and of much economic importance. On account of the great resisting power of the anthrax spore, hides and skins imported from countries where anthrax is prevalent are regarded as especially dangerous; and inasmuch as methods of disinfection which will destroy this spore may be expected to kill other organisms with ease, the problem resolves itself into securing the best disinfectant that will destroy anthrax spores without damaging the hides.

The two methods of disinfection especially investigated were the Seymour-Jones, the basis of which is mercuric chlorid, and the Schattenfroh, which employs hydrochloric acid. Exhaustive experiments were carried out in the comparison of these and other methods under varying conditions, although, of course, the disinfection of whole hides was incompatible with laboratory work. Under certain conditions of strength and deferred neutralization the Seymour-Jones method was found to be efficient, while the Schattenfroh method was, in a majority of instances, still more so. The author concludes that the latter seems to be far superior to other methods and well worth a trial as a standard method for the disinfection of hides. Small pieces of hide treated by both methods were tanned under laboratory conditions, and it was found that neither of them exerted any injurious effect upon the hide or leather.

Meat inspection and sanitation.—George H. Shaw, sanitary engineer, Meat Inspection Division, read a paper entitled "The Federal Meat Inspection Service and Sanitation of Packing Houses under its Supervision" before the last general session of the American Public Health Association, which was subsequently published in the *American Journal of Public Health* (vol. 5, no. 3). The paper contains a succinct history of the Federal meat-inspection service and briefly describes the various operations by which the meat and meat-food products thus inspected are rendered safe for public consumption. The three important functions of the meat inspection are thus described: (1) To protect the consumer from tainted and diseased meats; (2) to insure proper sanitary conditions and cleanly conduct of operations; (3) to prevent adulteration and fraudulent labeling.

The author, of course, deals somewhat exhaustively with those features of the service which are of special interest to the sanitary engineer, namely, water supply, drainage equipment and disposal of wastes, control of odors, and structural conditions of the plants. The paper, in conclusion, directs attention to the need of supplementing the Federal inspection with efficient State and municipal inspection. It is perhaps not sufficiently known by the general public that more than one-third of the total meat slaughtered in the United States is not inspected by the Government; neither can it be under the present laws, since those slaughtering places which provide meat for consumption entirely within a single State are beyond the jurisdiction of the Federal Government. Moreover, this un-

inspected residue contains an abnormally high percentage of diseased animals which are sent to these places to avoid being condemned by Federal inspectors.

It is true this evil is offset in some localities through the operation of State and municipal inspection, and future improvement, it is pointed out, is to be found in a greater development of such inspection and in the expansion of the municipal abattoir system, which has proved to be so successful in some European and Australian countries. The paper concludes with the statement that already considerable progress has been made and that the future promises a wider application of these desirable reforms.

CHEMISTRY NOTES.

(Contribution from Bureau of Chemistry.)

Cooperate in milk campaign.—Officials of the Bureau of Chemistry and of the Bureau of Animal Industry in cooperation with the State food officials of Iowa and Illinois have recently conducted a campaign to improve the milk supply in Davenport, Iowa, and Rock Island, Ill.

Poultry and egg laboratory at Indianapolis.—A laboratory has recently been established in Indianapolis, Ind., in order to facilitate the study of methods of handling, packing, shipping, and storing poultry and eggs.

Tanning on the farm.—A project has been planned by the leather and paper laboratory looking to the development of practical methods which may be economically and successfully used by farmers and small shoe and harness makers in the tanning of sole and harness leathers on a small scale.

Waterproofing fabrics for farm use.—Data are being collected in a study that has for its object the development of cheap and effective methods that may be used by farmers for waterproofing and mildewproofing fabrics for wagon covers, stack covers, and for other farm uses.

Warning against canning compounds and powders.—The attention of the department has been called to the fact that the canning season has brought the usual demand from housewives for salicylic acid, boric acid, and other canning compounds and powders for use in the home canning of fruits and vegetables. The department has issued a warning through the press against the use of such preparations for the reason that they may be injurious to health and are unnecessary.

ENTOMOLOGY ABSTRACTS.

(Contribution from Bureau of Entomology.)

Asparagus-beetle parasite.—The asparagus beetle (*Crioceris asparagi*) is attacked by a small four-winged fly known as *Tetrastichus asparagi*. Although what was probably this parasite was reported from Long Island over 50 years ago, it was not until the year 1909 that it was again observed, at Concord and Amherst, Mass., and the species described. Mr. F. A. Johnston, in the July number of the Journal of Agricultural Research, publishes an account of studies of the life history of this valuable insect under the title "Asparagus-Beetle Egg Parasite." Although the parasite deposits her eggs in the egg of the asparagus beetle, the egg of the beetle hatches, and the beetle larva feeds to maturity and enters the soil to form a pupal cell before it is killed by the parasitic larvæ.

Control of dried-fruit insects.—A study of the best methods of protecting dried fruits from the attacks of insects is reported in Bulletin No. 235, "Control of Dried-Fruit Insects in California," by William B. Parker. Although several species attack dried fruits on the Pacific coast, the most common and destructive are the Indian-meal moth (*Plodia interpunctella*) and the dried-fruit beetle (*Carophilus hemipterus*), which inflict a considerable financial loss on packers, wholesale men, and retailers.

Eggplant lace-bug.—Injury to eggplant by lace-bugs was first noticed during 1913, but it has since been found wherever eggplant is grown in this country on a commercial scale. The insect concerned, a new species known as *Gargaphia solani*, which appears to be native and to occur from the South Atlantic coast to the Southwestern States, is treated in Bulletin No. 239, "The Eggplant Lace-Bug," by David E. Fink. The bugs, in all stages from egg to adult, are found on the underside of the leaves. They are best combated by thoroughly spraying the leaves, particularly the underside, with fish-oil soap at the rate of 6 to 8 pounds to 50 gallons of water.

Plum borer.—Although it will probably never become a pest of more than ordinary importance, except in occasional isolated cases, the American plum borer, *Euzophera semifuneralis*, can do considerable real injury to trees which have

already been injured by hail, frost, etc., or which have been attacked by fungous diseases. It does not confine itself to plum, but is equally abundant on cherry, peach, and apple, and has been found feeding on pear, persimmon, mountain ash, and Russian mulberry. A study of the biology of this insect was made at Winchester, Va., in 1913 and 1914 by E. B. Blakeslee, the results being published under the title "American Plum Borer" in Bulletin No. 261. To prevent infestation dead bark around wounded and diseased areas should be promptly cut away and these areas painted. Where the borer has already established itself the cutting-out method is the only one that is effective.

Parandra borer in orchards.—The larva of a medium-sized brown beetle, *Parandra brunnea*, which has attracted considerable attention from its injuries to chestnut telephone and telegraph poles, also attacks living old, injured, or diseased trees. Its life history and habits as an enemy of apple, pear, and cherry trees are discussed by Fred E. Brooks in Bulletin No. 262, "The Parandra Borer as an Orchard Enemy." The Parandra borer enters only at a dead spot or cavity and throws no castings to the surface. The prompt application of proper methods of tree surgery will prevent attack and these methods should be used in removing the borers when already present.

Cranberry rootworm.—A beetle which has been well known to insect collectors for more than a century and is widely distributed in the United States has only recently been recorded as a cranberry pest in the bogs of New Jersey. Injury is most severe to vines growing on sandy land, or "savannas," and is caused by the feeding of the larvæ on the roots and runners, particularly the former. In the case of the large roots only the bark is eaten, but the fibrous roots are completely devoured. Thus small areas of vines are killed out. The beetles may be destroyed by the addition of an arsenical, such as arsenite of lime or arsenate of lead, to the customary Bordeaux resin-fishoil soap used to control the fungous diseases of the cranberry. Bulletin 263, "The Cranberry Rootworm," by H. B. Scammel, discusses the insect in detail.

Douglas fir pitch moth.—A large percentage of the defects in Douglas fir timber known as pitch seams, gum check, windshake, etc., have as their primary cause the work of the larvæ of the Douglas fir pitch moth (*Sesia novaroen-*

sis), although these defects have heretofore been variously charged to windshake (mechanical strain), lightning, frost, blazes, fires, and other causes. This insect is considered in Bulletin 255, entitled the "Douglas Fir Pitch Moth," by Josef Brunner. It works in the portion of the trunk which later clears itself of branches; hence only logs are affected which, were it not for previous infestation by it, would yield only the better grades of lumber. Trees are attacked when about 10 years old and after that until they are about 50 years old. While nothing can be done that will affect the lumber now being cut, the loss to future generations can be prevented by the employment of trained caretakers who make a daily inspection, at the proper period in the year, of those areas in which the trees have been found to have been injured from this cause in the past, removing the infested pitch tubes and cleaning, smoothing, and painting the wounds underneath. This will not only reduce future infestation by the destruction of the insects but will greatly lessen the damage from the wounds already made by the young larvæ.

Cone beetles.—Another and quite different form of forest-insect injury from the foregoing is that caused by the sugar-pine cone beetle (*Conophthorus lambertiana*) and the western yellow-pine cone beetle (*Conophthorus ponderosæ*), in the southern Rocky Mountain regions and Pacific coast. This damage is distinguished by the dying of the immature cones soon after the starting of the second year's growth. The blighted sugar-pine cones fall to the ground during the first summer, whereas the blighted yellow-pine cones may remain on the branches for several years. From a study of the life history of these insects in Bulletin No. 243, "Cone Beetles: Injury to Sugar Pine and Western Yellow Pine," by John M. Miller, it is shown that the remedy consists in collecting and burning, between September 1 and May 1, the fallen infested cones which, during that period, contain the broods of new adults.

Gipsy-moth food plants.—In controlling the gipsy moth the question as to its preferred food plants is of great importance. As early as 1907 it was noticed by several observers that some tree species were more often defoliated by gipsy-moth caterpillars than others. Further, it was discovered that newly hatched caterpillars can not feed upon pine foliage, and

that pine trees banded with tree tangle-foot before the eggs have hatched or the caterpillars developed beyond the first stage escaped injury. The results of observations and experiments in the field and in the laboratory during 1912, 1913, and 1914 are reported by F. H. Mosher in Bulletin No. 250, "Food Plants of the Gipsy Moth in America." As a result of feeding experiments on 150 native and ornamental trees and shrubs these have been put in four classes—(1) the favored food plants, (2) those favored by the later larval stages, (3) those not particularly favored but upon which a small proportion of larvæ may develop, and (4) those unfavored. Most of the tree species of commercial value, unfortunately, have to be included in classes 1 and 2, while oaks and the birches, which are favored food plants, predominate over much of the infested woodland area. Whenever any of the trees or shrubs in class 4 are growing together no injury from gipsy-moth attack need be feared, and the same is true of class 2, or a combination of classes 2 and 4. In case any of the species in class 3 are present there is a slight chance of injury, but for practical purposes no difficulty is likely to be experienced so long as the species in class 1 are not present. Recommendations are given for controlling the gipsy moth in apple orchards.

Katydid's injuring oranges.—The transformation of over 43,000 acres of semiarid grain-growing land in the San Joaquin Valley of California along the Sierra foothills between Bakersfield and Fresno into an irrigated citrus-growing area has brought into prominence certain formerly obscure native insects, among them two katydids, a detailed account of which is found in Bulletin 256, "Katydids Injurious to Oranges," by J. R. Horton and C. E. Pemberton. These katydids are doing each year an increasing injury to the orange crop. One of them, the fork-tailed katydid, *Scudderia furcata*, is particularly injurious, and caused a loss of fully one-fourth of the crop in several orchards in 1912. The angular-winged katydid, although associated with the fork-tailed species and commonly confused with it, is much less injurious and its feeding is confined exclusively to the foliage. In their earlier stages katydids can be successfully killed by spraying, and for this purpose two applications of arsenite of zinc (2 pounds per 100 gallons of water) or arsenate of lead (4 pounds per 100 gallons of water) are recommended. The first application should be made immediately after most of the petals have fallen and the second application from 10 days to 2 weeks after the first.

STATION PUBLICATIONS.

(Contribution from States Relations Service.)

The station publications noted in this list are not distributed by the Department of Agriculture, but can usually be obtained by department workers, as far as the supply will permit, by applying to the stations issuing them. An address list of the stations will be furnished upon request by the States Relations Service. Copies of these publications can be consulted in the library of that service and also ordinarily can be borrowed from the department library.

CROPPING SYSTEMS AND SOIL STUDIES.

- A Biochemical Study of Nitrogen in Certain Legumes. By A. L. Whiting. (Illinois Station Bulletin 179, pp. 471-542, figs. 23.)
- Soil Moisture and Tillage for Corn. By J. G. Mosher and A. F. Gustafson. (Illinois Station Bulletin 181, pp. 564-586, figs. 7.)
- Potassium From the Soil. By C. G. Hopkins and J. P. Aumer. (Illinois Station Bulletin 182, pp. 2-10, figs. 2.)
- How Not to Treat Illinois Soils. By C. G. Hopkins. (Illinois Station Circular 181, pp. 3-32.)
- Lake County Soils. By C. G. Hopkins et al. (Illinois Station Soil Report 9, pp. 52, pl. 1, figs. 9.)
- Improving Iowa's Peat and Alkali Soils. By W. H. Stevenson and P. E. Brown. (Iowa Station Bulletin 157, pp. 43-79, figs. 15.)
- The Determination of Ammonia in Soils. By R. S. Potter and R. S. Snyder. (Iowa Station Research Bulletin 17, pp. 3-19, fig. 1.)
- Tests of Varieties of Corn. By W. E. Hanger. (Maryland Station Bulletin 190, pp. 181-211, pls. 9.)
- The Composition and Value of Farm Manures. By O. F. Jensen. (Michigan Station Circular 25, pp. 3-7.)
- Experiments with Small Grains. By J. R. Kicks. (Mississippi Station Bulletin 171, pp. 3-12.)
- Barley Investigations. By C. P. Bull. (Minnesota Station Bulletin 148, pp. 5-47, figs. 12.)
- Variety Tests of Corn for 1914. By G. M. Garren. (North Carolina Station Bulletin 230, pp. 3-12.)
- Report on Variety Tests of Cotton for 1914. By R. Y. Winters. (North Carolina Station Bulletin 231, pp. 3-18.)
- On Nitrification, Preliminary Observations. By E. R. Allen and A. Bonazzi. (Ohio Station Technical Bulletin 7, pp. 5-42, figs. 6.)
- The Movement of Soluble Salts with the Soil Moisture. By F. S. Harris. (Utah Station Bulletin 139, pp. 119-124, figs. 2.)
- The Comparative Effect of Phosphates and Sulphates on Soil Bacteria. By E. B. Fred and E. B. Hart. (Wisconsin Station Research Bulletin 35, pp. 35-66, figs. 6.)

ANIMAL INDUSTRY.

- The Value of Barley for Cows Fed Alfalfa. By G. H. True et al. (California Station Bulletin 256, pp. 425-445, figs. 6.)
- When to Vaccinate Against Hog Cholera. (California Station Circular 132, pp. 4, fig. 1.)
- Pasteurization of Cream for Butter Making. I. Effect on Quality and Chemical Composition. By M. Mortensen et al. II. Bacteriological Studies. By B. W. Hammer. (Iowa Station Bulletin 156, pp. 3-40.)
- The Assumption of Male Secondary Characters by a Cow with Cystic Degeneration of the Ovaries. By R. Pearl and F. M. Surface. (Maine Station Bulletin 237, pp. 65-80, pls. 3.)
- The Maintenance Requirement of Cattle as Influenced by Condition, Plane of Nutrition, Age, Season, Time on Maintenance, Type, and Size of Animal. By P. F. Trowbridge et al. (Missouri College Station Research Bulletin 18, pp. 5-62, figs. 17.)
- The Intradermal Test in Bovine Tuberculosis. By H. Welch. (Montana Station Bulletin 105, pp. 351-380, figs. 20.)
- Do Low Scores Always Mean Poor Milk? By F. H. Hall. (New York State Station Bulletin 398, popular edition, pp. 3-11, fig. 1.)
- Specific Effects of Rations on the Development of Swine. By E. B. Forbes et al. (Ohio Station Bulletin 283, pp. 111-152, pls. 7.)

- The Metabolism of Organic and Inorganic Compounds of Phosphorus. By E. B. Forbes et al. (Ohio Station Technical Bulletin 6, pp. 3-80, figs. 23.)
- A Metabolism Crate for Swine. By E. B. Forbes. (Ohio Station Circular 152, pp. 75-85, figs. 10.)
- Silage and Grains for Steers. By J. W. Wilson. (South Dakota Station Bulletin 160, pp. 195-223, figs. 10.)
- A Study of Grazing Conditions in the Wenaha National Forest. By H. T. Darlington. (Washington Station Bulletin 122, pp. 3-18, pls. 7.)
- The Babcock Test and Its Application. By R. E. Hundertmark. (Washington Station Popular Bulletin 75, pp. 14, figs. 6.)
- Some Facts About Concentrated Feeds. By W. H. Strowd. (Wisconsin Station Bulletin 253, pp. 60, fig. 1.)

FRUITS AND VEGETABLES.

- Smudging an Orchard with Native Material in Alabama. By R. E. Malone. (Alabama Tuskegee Station Bulletin 28, pp. 3-8.)
- Possibilities of the Sweet Potato in Macon County, Ala. By G. W. Carver. (Alabama Tuskegee Station Bulletin 30, pp. 5-22, figs. 8.)
- Cabbage Growing in California. By S. S. Rogers. (California Station Circular 130, pp. 22, figs. 9.)
- Spray Calendar. By F. W. Faurot. (Missouri Fruit Station Circular 6, pp. 2-12, figs. 7.)
- Tomato Tests. By O. B. Whipple and L. G. Schermerhorn. (Montana Station Bulletin 104, pp. 339-347, figs. 5.)
- Dwarf Apples. By U. P. Hedrick. (New York State Station Bulletin 406, pp. 341-368, pls. 7.)
- Cherries of New York. By U. P. Hedrick et al. (New York State Station Annual Report, 1914, pt. 2, pp. XII + 371, pls. 57.)
- Small Fruits for Home and Commercial Planting. By L. F. Sutton. (West Virginia Station Bulletin 149, pp. 38, figs. 16.)

INSECTS AND ANIMAL PARASITES.

- The Citricola Scale. By H. J. Quayle. (California Station Bulletin 255, pp. 405-421, figs. 7.)
- Spraying for the Control of the Walnut Aphid. By A. R. Tylor. (California Station Circular 131, pp. 11, figs. 2.)
- Protecting Cabbage and Cauliflower from Attacks by Worms. By E. S. Tucker. (Louisiana Stations Bulletin 154, pp. 2-16, figs. 2.)
- Leafhoppers of Maine. By H. Osborn. (Maine Station Bulletin 238, pp. 81-160, figs. 25.)
- Insect Pests of Field Crops. By L. Haseman. (Missouri College Station Bulletin 134, pp. 39, figs. 39.)
- The Grape Leafhopper. By D. E. Merrill. (New Mexico Station Bulletin 94, pp. 3-33, figs. 10.)
- Observations and Experiments on the San José Scale. By S. A. Forbes. (Illinois Station Bulletin 180, pp. 545-561, figs. 3.)
- Common Corn Insects. By R. L. Webster. (Iowa Station Circular 23, pp. 2-16, figs. 15.)
- Poultry Parasites: Some of the External Parasites that Infest Domestic Fowls, with Suggestions for their Control. By G. W. Herrick. (New York Cornell Station Circular 29, pp. 29-39, figs. 5.)
- La Apicultura Portorriqueña. By E. F. Phillips. (Porto Rico Federal Station Bulletin 15, Spanish Edition, pp. 28, pls. 2.)

PLANT DISEASES.

- Some New Bacterial Diseases of Legumes and the Relationship of the Organisms Causing the Same. By T. F. Manns. (Delaware Station Bulletin 108, pp. 3-44, figs. 21.)
- Apple Spraying Experiments in 1914. By W. J. Morse and M. Shapovalov. (Maine Station Bulletin 240, pp. 177-196.)

INSPECTION AND METEOROLOGY.

- Commercial Fertilizers. By W. J. Jones, Jr., et al. (Indiana Station Bulletin 180, pp. 407-520, fig. 1.)
- Commercial Fertilizers: I. Analyses of Inspection Samples of Fertilizers. By J. T. Willard and R. C. Wiley. II. Value and Use. By C. O. Swanson. (Kansas Station Bulletin 204, pp. 3-40.)
- Meteorological Observations at the Massachusetts Agricultural Experiment Station. By J. E. Ostrander and D. Potter. (Massachusetts Station Meteorological Bulletin 318, pp. 4.)
- Analyses of Commercial Fertilizers. By P. H. Wessels et al. (Rhode Island Station Inspection Bulletin, 1914, September, pp. 2-8.)
- Analyses of Commercial Fertilizers. By P. H. Wessels et al. (Rhode Island Station Inspection Bulletin, 1914, October, pp. 3-11.)

SELECTED LIST OF ACCESSIONS TO DEPARTMENT LIBRARY.

July, 1915.

AGRICULTURE AND AGRICULTURAL PRODUCTS.

- Abel, Peter. Notes on sugar machinery and manufacture in northern India, 1914. 16 p. Calcutta, 1915. (Pusa, India. Agricultural research institute. Bulletin no. 47)
- Balls, W. L. The development and properties of raw cotton. 221 p. London, 1915.
- Engelbrecht, T. H. Die feldfrüchte Indiens in ihrer geographischen verbreitung. 271 p. Hamburg, 1914. (Abhandlungen des Hamburgischen kolonialinstituts. bd. 19)
- Hansen, J. Die sorghumhirse als futtermittel. 151 p. Berlin, 1914. (Arbeiten der Deutschen landwirtschafts-gesellschaft. . . hft. 264)
- Heyer, Theodor. Reisebilder aus Finnland. 103 p. 1914. (Arbeiten der Deutschen landwirtschafts-gesellschaft. . . hft. 263)
- Holm, G. T. Agriculture in Argentina. 30 p. Buenos Aires, 1914.
- Howard, Albert, and Howard, G. L. C. The improvement of tobacco cultivation in Bihar. 19 p. Calcutta, 1915. (Pusa, India. Agricultural research institute. Bulletin no. 50)
- Jordan, R. W. Onions. 95 p. St. Paul, 1915.
- Main, Josiah. The agriculture of Pike county, Ill. 22 p. Ithaca, N. Y., 1915.
- Maine—Dept. of agriculture. Growing and harvesting hay. Seed improvement work. 16 p. Augusta, 1915. (Bulletin. June, 1915. v. 14, no. 2)
- Müller, Karl. Das franzosenkraut. 31 p. Berlin, 1914. (Arbeiten der Deutschen landwirtschafts-gesellschaft. . . hft. 272)
- Nelson, W. L. Wheat stacking. 18 p. Columbia, Mo., 1915. (Missouri. State board of agriculture. Monthly bulletin. June, 1915. v. 13, no. 6)
- Otis, D. H. Farm accounts simplified. 42 p. New York, 1915.
- Van Slyke, L. L. Modern methods of milk testing and milk products. . . 2d ed. 286 p. New York, 1913.
- Waters, H. J. The essentials of agriculture. 455 p. Boston [1915]

HORTICULTURE.

- Brett, Walter. War-time gardening. 64 p. London [1915]
- Dean, Richard. The sweet pea bicentenary celebration. 75 p. [London, 1901]
- Deutschland's obstarten. . . v. 8, pt. 2, no. 28-30. Stuttgart, 1912.
- Hedrick, U. P. The cherries of New York. 371 p. Albany, 1915. (Report of New York Agricultural experiment station. . . 1914. 2)
- National sweet pea society. Official catalogue of sweet pea names. 31 p. [London, 1912]
- Riston, Jacques, baron. Contribution à l'histoire de la vigne et de sa culture dans la région Lorraine. 596 p. Nancy, 1914.
- Sanders, T. W. The flower garden. . . 2d ed. 480 p. London [1913]
- Step, Edward. Favourite flowers of garden and greenhouse. 4 v. London, 1896-97.
- Wright, H. J. Sweet peas. . . Rev. ed. 116 p. London, 1914.

FORESTRY AND FOREST PRODUCTS.

- Lawson, W. P. The log of a timber cruiser. 214 p. New York, 1915.
- Lewis, R. G., and Boyce, W. G. H. Wood-using industries of the prairie provinces. 75 p. Ottawa, 1915. (Canada. Dept. of the interior. Forestry branch. Bulletin no. 50)
- Massachusetts—State forester. The older forest plantations in Massachusetts. Conifers. [By] J. R. Simmons. 38 p. Boston, 1915.

DOMESTIC ANIMALS.

- Ekelund, J. Avelscentra för nötboskap. 737 p. Linköping, 1915. (Sweden. Kongliga landbruksstyrelse. Meddelanden. n:r 6 år 1914)
- Hadlington, James. The construction of poultry buildings. 15 p. Sydney, 1915. (New South Wales. Dept. of agriculture. Farmers' bulletin. no. 100)
- Honcamp, Franz. Auf welche höhe stellt sich die zweckmässige nährstoffgabe bei der mästung des rindes? 130 p. Berlin, 1914. ([Germany. Reichsamt des innen] Bericht über landwirtschaft. hft. 36)
- Neumann, J. Die verwendung von deutschem zuchtvieh in Deutsch-Südwestafrika in reinzucht und zur veredelung der dortigen rindviehbestände. 35 p. Hamburg, 1914. (Abhandlungen des Hamburgischen kolonialinstituts. bd. 26)

- Porter, John. The stockfeeder's companion. 316 p. London, 1915.
- Stockowner's guide. . . 3d impression. 286 p. Sydney [1914]
- Timmis, R. S. Modern horse management. 233 p. London [1915?]
- Wagner, J. H. The cavy our fancy guinea pig. 29 p. Baltimore, 1915.
- Wortley, E. J. Poultry diseases. 123 p. New York, 1915.

CHEMISTRY.

- Holland, J. W. A text-book of medical chemistry and toxicology. . . 4th ed. 678 p. Philadelphia, 1915.
- Malenković, Basilius. Die holzkonservierung im hochbaue. 301 p. Wien, 1907.
- Russell, E. J. Soil conditions and plant growth. . . New ed. 190 p. London, 1915. (Monographs on biochemistry)
- Taylor, W. W. The chemistry of colloids. 328 p. London, 1915.

HOME ECONOMICS.

- Nesbitt, Florence. Low cost cooking. 127 p. Chicago, 1915.
- Ousley, Clarence. Smith-Lever fund and extension in home economics. 11 p. College Station, Tex., 1915.

MEDICINE, HYGIENE, AND PHYSIOLOGY.

- Benedict, F. G. A study of prolonged fasting. 416 p. Washington, 1915. (Carnegie institution of Washington. Publication no. 302)
- Gerhard, W. P. The disposal of household wastes. . . 3d ed. New York, 1915.
- Harrington, Charles. A manual of practical hygiene. . . 5th ed. 933 p. Philadelphia, 1914.
- Mallory, F. B., and Wright, J. H. Pathological technique. . . 6th ed. 536 p. Philadelphia, 1915.
- Morrow, A. S. The immediate care of the injured. . . 2d ed. 354 p. Philadelphia, 1912.
- Raventós, Jaume. L'alimentació de l'home. 38 p. Barcelona, 1915.

MICROSCOPY.

- Meyer, Arthur. Erstes mikroskopisches praktikum. . . 3. aufl. 255 p. Jena, 1915.

BOTANY.

- Armstrong, Margaret. Field book of western wild flowers. 596 p. New York, 1915.
- Chamberlain, C. J. Methods in plant histology. . . 3d ed. 314 p. Chicago [1914]
- Darnell-Smith, G. P., and Mackinnon, E. Fungus and other diseases of the apple and pear. 45 p. Sydney, 1915. (New South Wales. Dept. of agriculture. Farmers' bulletin. no. 99)
- Hardy, M. E. An introduction to plant geography. 192 p. Oxford, 1913.
- McAlpine, Daniel. Bitter pit investigation. . . 3d progress report. 1913/14. Melbourne, 1914.
- Müller, K. F. L. Die lebermoose. abt. 1, lfg. 21-22. Leipzig, 1915. (Dr. L. Rabenhorst's Kryptogamen-flora von Deutschland. . . 6. bd., lfg. 21-22)
- Ricken, Adalbert. Die blätterpilze (Agaricaceae) Deutschlands. lfg. 13/14. Leipzig, 1915.

ZOOLOGY.

- Baynes, E. H. Wild bird guests. 326 p. New York, 1915.
- British ornithologists' union. A list of British birds. . . 2d ed. 430 p. London, 1915.
- Fleischer, Ant. Bestimmungs-tabellen der europäischen coleopteren. . . hft. 73. Paskau, 1914.
- Pratt, H. C. The Malayan locust. 42 p. Kuala Lumpur, 1915. (Federated Malay States. Dept. of agriculture. Bulletin no. 24)
- Shipley, A. E. The minor horrors of war. . . 2d ed. 178 p. London, 1915.
- Thompson, M. T. An illustrated catalogue of American insect galls. . . Ed. by E. P. Felt. 116 p. Nassau, N. Y., 1915.
- Wilson, H. F. Orchard insect pests and methods of control. 126 p. [Orengo, Ore., 1915]

ECONOMICS AND STATISTICS.

- Bullock, E. D., comp. Agricultural credit. 177 p. White Plains, N. Y., 1915.
- Disconto-gesellschaft, Berlin. Economic life in Germany during the war. 109 p. Berlin, 1915.
- Hough, B. O. Ocean traffic and trade. 432 p. Chicago [1914]

International institute of agriculture—Bureau of statistics. Stocks visibles de froment et farine de froment, de sucre, de café, de coton et de soie; 1903-12. 79 p. Rome, 1914.

Missouri country life conference. Report . . . 1915. Columbia [1915] (Missouri. State board of agriculture. Monthly bulletin, May, 1915. v. 13, no. 5)

Warber, G. P. Social and economic survey of a community in northeastern Minnesota. 115 p. Minneapolis, 1915. (Minnesota. University. Current problems, no. 5)

BUSINESS EFFICIENCY.

Office management. 128 p. Chicago [1914]

Personal efficiency in business. 128 p. Chicago [1914]

ENGINEERING.

Davies, J. P. Engineering office systems and methods. 544 p. New York, 1915.

Kerstew, C. Brücken in eisenbeton . . . 3. aufl. v. 2. Berlin, 1913.

FIRE PREVENTION AND EXTINCTION.

American school of correspondence. Cyclopaedia of fire prevention and insurance. 4 v. Chicago, 1914.

Crocker, E. F. Fire prevention. 354 p. New York, 1912.

Kenlon, John. Fires and fire-fighters. 410 p. New York [1913]

ADDITIONS TO PERIODICALS CURRENTLY RECEIVED.

Alberta—Dept. of agriculture—Statistics branch. Crop bulletin. Edmonton.

British journal of photography. [weekly] London.

California's magazine [quarterly] San Francisco. no. 1 (672 p.) describes the resources of California.

China—Dept. of agriculture and commerce. Journal [monthly] [Peking?]

Colombia—Ministerio de agricultura y comercio. Revista agricola [monthly] Bogota.

Farm bureau monthly. Orland, Cal.

Gulf coast fruit grower and farmer [monthly] Mobile, Ala.

Gumá and Mejer, Havana. Producción de azucarera de la Isla de Cuba [monthly] Habana.

Iowa—State college of agriculture and mechanic arts—Extension dept. Junior circular. Ames, Ia.

Mail-order business builder [monthly] Lansing, Mich.

Michigan—Agricultural college—Extension division. Club bulletin. [East Lansing, Mich.]

Mutual dairyman [monthly] [Salt Lake City]

Mutual insurance journal [monthly] Lincoln, Neb.

The Organized farmer [weekly] Wausau, Wis.

Poultry tribune [monthly] Mount Morris, Ill.

Rutgers college—Division of extension in agriculture and home economics. New Jersey state agricultural college extension bulletin. New Brunswick, N. J.

Wisconsin potato journal [quarterly] Madison, Wis.

SOURCES OF INFORMATION.

It may not be known generally that the reading-room attendants of the Library of Congress will verify any address from any city directory on its shelves, by telephone, for official use in the Federal departments. It also will complete an address by telephone when the surname, initials, and city are known.

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